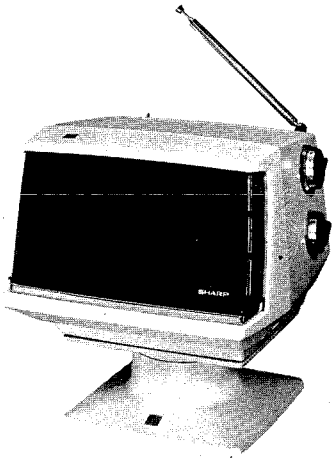
SHARP Service Manual



MODEL
5P – 12S
Portable TV

ELECTRICAL SPECIFICATIONS

Power Supply	12 ~ 17 Volts DC or 220 Volts 50Hz AC
Power Consumption	12 watts AC, 5.5 watts at 12 volts DC
Picture Size	Approximately 13 sq.in.
Tuning Ranges	VHF-Channels 2 thru 12 UHF-Channels 21 thru 69
Intermediate Frequency	Picture 38.9MHz Sound 33.4MHz
Antenna Input Impedance	240 ohms balanced
Intercarrier Sound System	5.5MHz
Speaker Size & Type	2-9/16" (6.5P-0832) Round
Voice Coil Impedance	32 ohm @400Hz
Weight	Approx. 7.7 lbs.

SEMICONDUCTOR COMPLEMENT

TR1	2SC398 or 2SC683B	VHF RF Amp.
TR2	2SC399 or 2SC683V	VHF Mixer
TR3	2SC385 or 2SC717	VHF Oscillator
TR4	2SC682 Ⓐ	1st Picture IF Amp.
TR5	2SC682 Ⓐ	2nd Picture IF Amp.
TR6	2SC717	3rd Picture IF Amp.
TR7	2SC454 Ⓒ	1st Video Amp.
TR8	2SC458 Ⓒ	AGC Amp.
TR9	2SC458 Ⓒ	AGC Gate
TR10	2SC454 Ⓑ	2nd Sound IF Amp.
TR11	2SC458 Ⓒ	Audio Driver
TR12	2SA673 Ⓒ	Audio Output
TR13	2SC1213 Ⓒ	Audio Output
TR14	2SB75 Ⓑ	Sync. Separator
TR15	2SC458 Ⓒ	Vertical Oscillator
TR16	2SC458 Ⓓ	Vertical Driver
TR17	2SA673 Ⓒ	Vertical Output
TR18	2SC1213 Ⓒ	Vertical Output
TR19	2SC458 Ⓒ	Phase Splitter
TR20	2SA15 Ⓨ	Horizontal Oscillator
TR21	2SB77A Ⓑ	Horizontal Driver
TR22	2SC680 Ⓡ	Horizontal Output
TR23	2SC856	2nd Video Amp. (Output)
TR24	2SB337 Ⓑ	Power Regulator
TR25	2SC281 Ⓑ	Error Amp.
TR26	2SC454 Ⓑ	1st Sound IF Amp.
TR27	2SC387 A or 2SC684	UHF Oscillator
TR28	2SC761 or 2SC787 or 2SC1117	UHF RF Amp.
D1	1S750 or 1N82AG	UHF Mixer
D2	1S1555	UHF RF Amp. Protector
D201	1N60	Picture Detector
D202	1N34A	AGC Dely
D203	1N34A	AGC Gate
D301	1N60	Sound Detector
D302	1N60	Sound Detector
D401	VARISTOR-5 (KB-262)	Audio Output Bias Stabilizer
D601	1N34A	Blanking Corrector
D602	VARISTOR-5 (KB-262)	Vertical Output Bias Stabilizer
D701	1N34A	A.F.C Phase Detector
D702	1N34A	A.F.C Phase Detector
D901	VARISTOR-5 (KB-262)	+B Drift Control by Temp.
SR201	SI-RECT152 (1S2076)	AGC Deley (Tuner)
SR701	SI-RECT170 (10D4) or SI-RECT122 (FG-2N)	Horizontal Damper
SR702	SI-RECT-36 (HFSD-1) or SI-RECT180 (BB4)	Rectifier (100V)
SR703	SELEN30 (HS-6/lbs)	High Voltage Rectifier
SR704	SELEN30 (HS-6/lbs)	High Voltage Rectifier
SR705	SELEN30 (HS-6/lbs)	High Voltage Rectifier
SR901	SI-RECT178 (10DC-1R)	+B Rectifier
SR902	SI-RECT174 (10DC-1N)	+B Rectifier
ZD901	SI-RECT168 (KZ-6A)	Zener

SHARP CORPORATION OSAKA, JAPAN

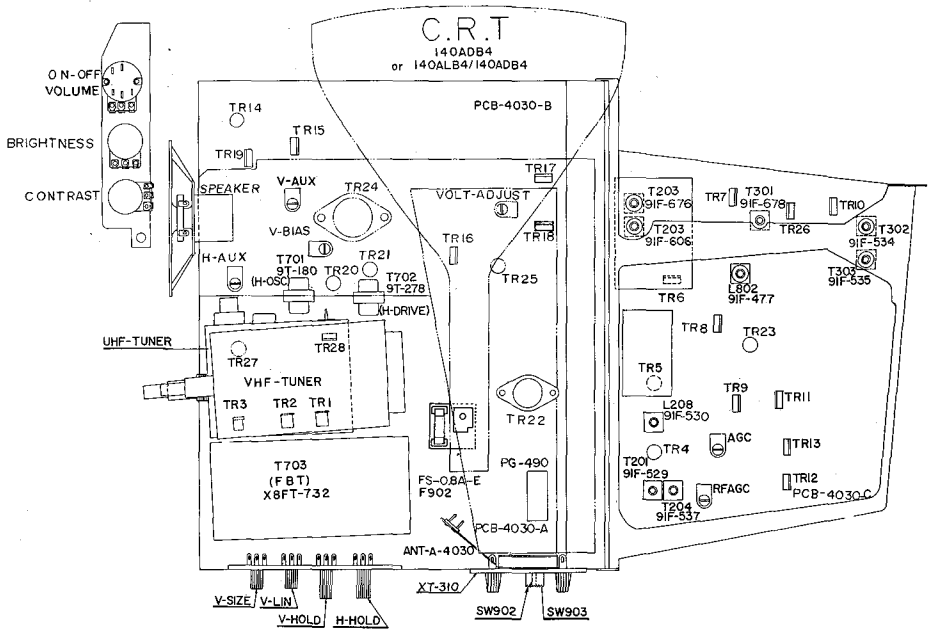


Figure 1 Chasis Layout

INSTALLATION AND SERVICE INSTRUCTIONS

Deflection Yoke Adjustment

If the lines of the raster are not horizontal or squared with the picture mask, loosen the yoke clamp and rotate the deflection yoke until this condition is corrected. To obtain best results, the deflection yoke should be positioned as far forward on the neck of the picture tube as possible.

Centering Adjustment

Both horizontal and vertical centering are accomplished by rotating the centering rings mounted on the back of the deflection yoke assembly.

Focus Adjustment

The picture tube used in this receiver is focused electrostaticly by means of a focus electrode in the gun assembly. Under certain operating conditions, focus may be improved by reconnecting the lead from pin 7 of the picture tube socket to another one of the three connection points located on printed circuit board assembly K-UNIT502B.

Vertical Size, Linearity and Bias Adjustment

Adjust the VERTICAL SIZE (R701D), VERTICAL LINEARITY (R701C) and VERTICAL BIAS (R623) controls for best overall vertical linearity and picture size, After making these adjustments it may be necessary to slightly readjust the centering rings.

Horizontal Hold Adjustment

Should the picture fall out of the horizontal sync., the HORIZONTAL HOLD control (R701A) must be readjusted to restore stability. When this control has been properly adjusted, the picture should not fall out of sync when channels are switched or if the transmitted signal is momentarily interrupted.

Vertical and Horizontal Hold Auxillary Adjustments

The V-AUX. (R622) and H-AUX. (R720) controls are located on printed circuit board K-UNTIT502B as shown in Figure 1. These controls are used to maintain the proper operating range of the VERTICAL HOLD (R701B) and HORIZONTAL HOLD (R701A) controls respectively. Set R701B and/or R701A to the center of mechanical rotation, then adjust R622 and/or R720 until the picture is properly locked in sync vertically and/or horizontally

NOTE: Controls R622, R623 and R720 are mounted on the component side of K-UNIT 502B. In order to adjust these controls, the receiver must be operated with the cabinet back removed and the bracket, on which K-UNIT502A and TR24 are mounted, must be separated from the chassis frame. A long, thin bladed, non-metallic screwdriver must be used to adjust these controls.

RF Oscillator Adjustment (VHF Tuner)

Individual oscillator adjustments are provided for each of the VHF channels. These adjustments may be performed without removing the chassis from the cabinet. Simply set the VHF Channel Selector to the desired channel. Set the VHF Fine Tuning to the center of its range and then remove both knobs from the cabinet to obtain access to the adjustment. Using a thin nonmetallic screw-driver, adjust the oscillator slug for best picture and sound. Reinstall the knobs when adjustments are completed.

DC Voltage Adjustment

The VOLTAGE ADJUST control (R907) is mounted on the component side of K-UNIT502A. In order to adjust this control, the receiver must be operated with the cabinet back removed.

1. Connect AC line cord to a variable voltage transformer (Item No. 21161A, or equivalent) and turn receiver ON.
2. Adjust AC line voltage supplied to receiver to 120V.
3. Connect a DC voltmeter between connection point K36 on K-UNIT502A and chassis ground.
4. Set VOLTAGE ADJUST control (R907) to obtain a reading of 11.0V

AGC Adjustment

The RF AGC control (R264) and AGC control (R265) are both mounted on the component side of K-UNIT502C. In order to adjust these controls, the receiver must be operated with the cabinet back removed. Both of these controls have been factory adjusted for proper operation under normal signal reception conditions. Under these conditions, the voltage reading measured between test point TP801 and chassis ground is approximately 1.0Vp-p on Oscilloscope.

Under adverse signal reception conditions, it may be necessary to readjust R264 and/or R265. If the received picture is exceptionally snowy, tune in the weakest station and adjust R264 for minimum snow in the picture. If the received picture displays overload and bending of vertical line structure and/or the received sound is distorted, tune in the strongest station and adjust R265 to obtain normal picture response and sound quality.

Fuses

For overload protection, two fuses are provided. F901, a 0.2 amp. fuse installed in the AC input to the receiver, is located in the AC adaptor. In order to replace this fuse, the battery compartment must be separated from the cabinet and the metal shield covering the AC power supply must be removed. F902, a 0.8 amp. fuse installed in the DC input to the receiver, is located on the K-UNIT-502A. In order to replace this fuse, the battery compartment must be separated from the cabinet and the cabinet back separated from the cabinet front.

CHASSIS ASSEMBLY REMOVAL

1. When removing the Battery case.
   Remove the Battery Case Retaining screws with coin or screw driver.
2. Remove the five screws retaining the back cabinet and remove it.
3. Remove the two screws retaining the chassis to the front cabinet.
4. Remove the four screws retaining the chassis bracket to the top of the front cabinet.
5. Pull the chassis assembly and Remove the two screws retaining the control bracket from the front cabinet.
6. Remove the Earphone jack, CRT socket, coating earth lead, anode cap and deflection yoke.
7. Remove the chassis assembly.

ALIGNMENT INSTRUCTIONS

EQUIPMENT

1. Television Sweep Generator
2. Television Marker Generator
3. Oscilloscope
4. Variable Bias Supply
5. VTVM
6. Matching Pad

PICTURE IF SWEEP ALIGNMENT (Refer to Figure 5 for test equipment connections)

NOTE: The following steps should be performed with the AC line cord disconnected from the receiver. Test equipment should be turned on and allowed to warm up at least 10 minutes before starting alignment. Excessive signals from the Sweep Generator, Marker Generator and/or Bias Supply can cause overloading of the receiver circuits and distortion of the response curve.

1. Connect negative lead of Bias Supply to chassis ground. Connect one positive lead of Bias Supply to the AGC terminal on the VHF tuner and another positive lead to TP202 and K-UNIT-502C.
2. Set Sweep Generator to produce IF output with 10 MHz sweep width. Connect IF/Video output through the Matching Pad to TP101 on the VHF tuner. Connect ground clip of Matching Pad to tuner chassis near TP101.
3. Loosely couple the Marker Generator output lead to the output lead of the Sweep Generator.
4. Calibrate Oscilloscope for a two inch equals 1V P-P display and connect direct probe through a 15K ohm resistor to TP801. (See Figure 2.)

NOTE: The following steps should be performed with the AC line cord connected to the receiver and the AC power switch (SW902) set in ON position.

5. Set the VHF Channel Selector to channel 9 or 10. (Fine tuning must be set to proper RF oscillator frequency. Antenna must be disconnected from the tuner.)
6. Using the VTVM to monitor voltage readings, adjust the Bias Supply to produce 5.0V at TP202.
7. Adjust the attenuator on the Sweep Generator until a 1V P-P display is obtained on the Oscilloscope.
8. Alternately set the Marker Generator to 33.4MHz and 40.4MHz and check for correct frequency placement on the response curve. Adjust L208 to properly position the 40.4MHz marker in the trap on the response curve. (In order to observe the trap, it may be necessary to increase the sweep output to excede the 1V P-P display and/or reduce the bias voltage being applied to the tuner. After proper trap adjustment has been verified, restore bias to approximately 1.6 volts and reset Sweep Generator output to produce 1V P-P display.)
9. Alternately set the Marker Generator to produce markers at 42.75 MHz and 38.9 MHz. Adjust T101 (on VHF tuner), T202, T203 and L210 to obtain a response curve on the Oscilloscope that closely matches the curve shown in Figure 4.

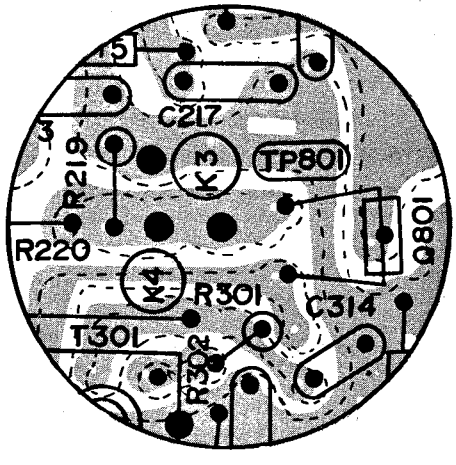


Figure 2

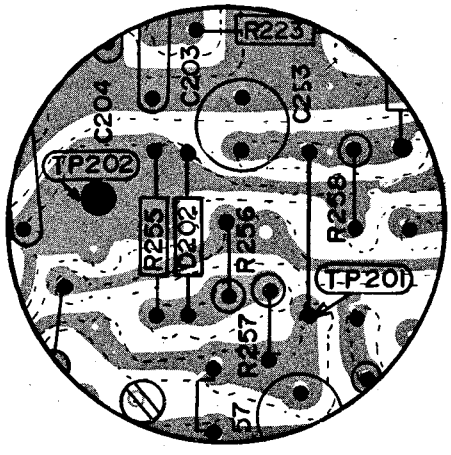


Figure 3

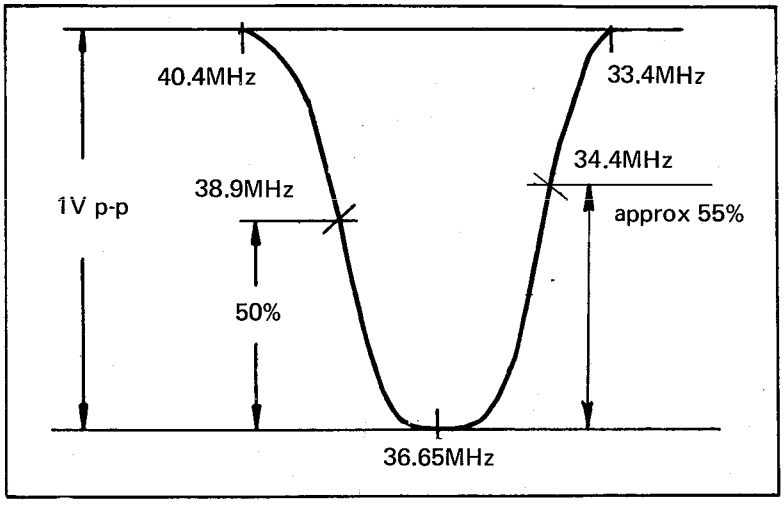


Figure 4

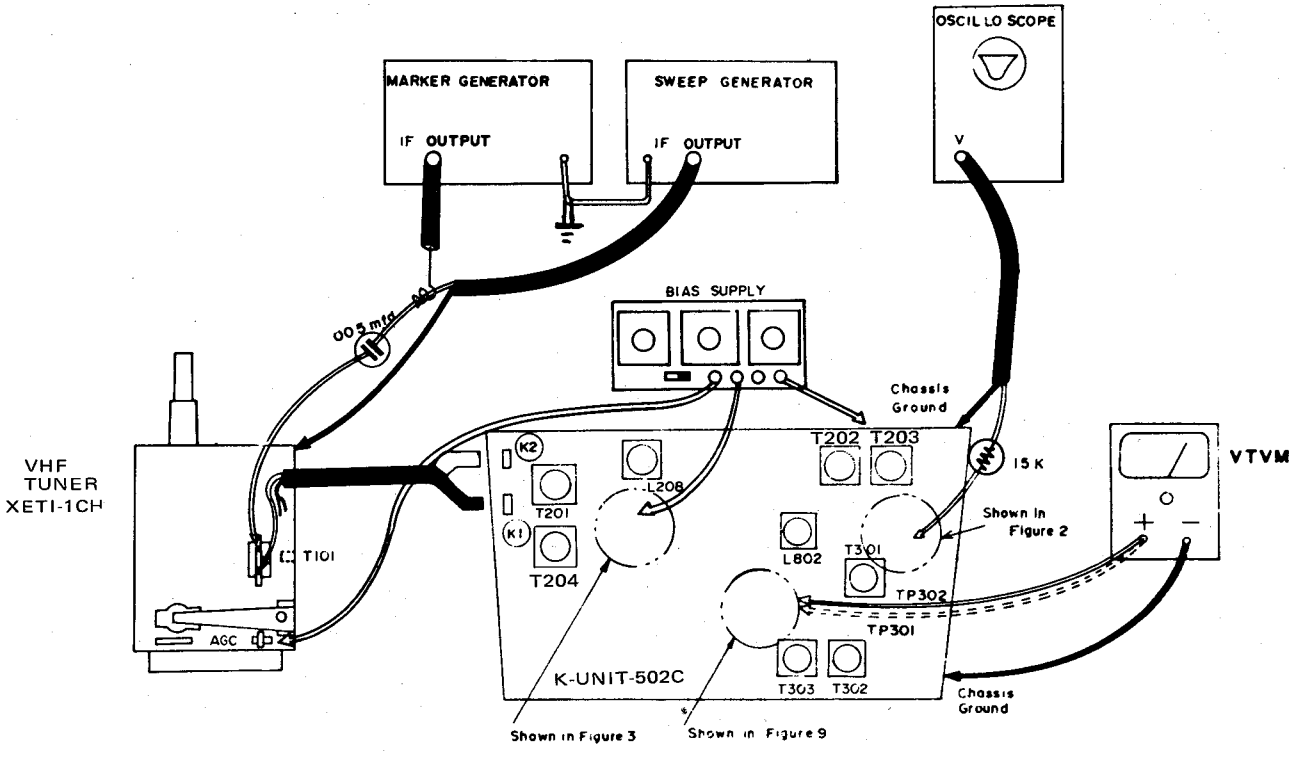


Figure 5

VHF/UHF TUNER PERFORMANCE CHECK (Refer to Figure 6.)

PRELIMINARY INFORMATION

Unless there is evidence of tampering or if electrical repairs have been made, tuner alignment is normally not required. Response Curve "A" is an indicator of the quality of tuner performance. If the response curve is obviously bad on all channels, repair, rather than alignment, is indicated. Check the B plus voltages applied to the tuners. Also check for bad solder connections and contacts. Visually inspect the circuits for overheated components and obvious wiring defects.

NOTE: When checking overall RF-IF response curves, bear in mind that it is necessary to verify that the video IF circuitry is operating normally and is properly aligned before an evaluation can be made on the VHF RF-IF response curve. Also, it is necessary to verify that the video IF circuitry and VHF tuner are operating normally and that these circuits are properly aligned before an evaluation can be made on the UHF RF-IF response curve.

VHF TUNER PERFORMANCE CHECK

Test Equipment Connections

GENERAL . . . The set under test should be correctly fine tuned. Fine tuning should not be adjusted while performing this tuner check. Disconnect external antenna from VHF tuner.

OSCILLOSCOPE . . . With a 1.0V P-P calibration, connect direct probe through a 15K ohm resistor to TP801.

SWEEP GENERATOR . . . Connect output to the VHF tuner antenna terminals using proper matching pad.

MARKER GENERATOR . . . Connect markers at 38.9 and 34.4MHz loosely to Sweep Generator leads.

BIAS SUPPLY . . . Apply +5 volts bias to TP202 and +1.6V bias to AGC terminal on VHF tuner. Adjust biases while chassis is operating.

Performance Check Turn set "on".

Starting with the VHF tuner placed in the Channel 13 position and the Sweep Generator set at the proper frequency, check the overall response curve as viewed on the Oscilloscope. This viewed curve should match, approximately, Response Curve "A". The same procedure should be used for Channels 12 through 2.

UHF TUNER PERFORMANCE CHECK

Test Equipment Connections

GENERAL . . . The video IF Alignment and VHF Tuner Check should be completed prior to this procedure. Disconnect the external antenna from UHF tuner. All equipment connections are the same as for the VHF Tuner Performance Check except the Sweep Generator.

SWEEP GENERATOR (UHF) . . . Connect output to UHF tuner antenna terminals using proper matching pad.

Performance Check

Turn set and test equipment "on".

Place the VHF tuner in the UHF position.

Set the center frequency of the Sweep Generator at 700 MHz. and tune the UHF tuner to this frequency (approximately Channel 50) so that the overall RF-IF response curve can be observed on the Oscilloscope. This response curve should be consistent with limits of the overall RF-IF Response Curve "A".

NOTE: The amplitude of the response curve should be kept at 1V P-P for this alignment.

Tune the Sweep Generator and the UHF tuner throughout the UHF range to check the overall performance.

ALIGNMENT

NOTE: The following alignment procedures are accomplished with the receiver operating normally while connected an antenna and tuned to receive a local telecast with the AGC control (R265) adjusted for best reception.

5.5MHz SOUND TRAP ALIGNMENT

1. Connect the Oscilloscope through its direct probe to connection point K14 on K-UNIT-502C.
2. Turn "ON" receiver and Oscilloscope and allow a proper warm-up period.
3. Switch the Oscilloscope to the TV HORIZ RATE position and observe the sync pulse on the oscilloscope screen.
4. Fine tune until sound appears in the sync pulse (See Figure 7).
5. Adjust the 5.5MHz sound trap (L802) for minimum sound in the sync pulse (See Figure 8).

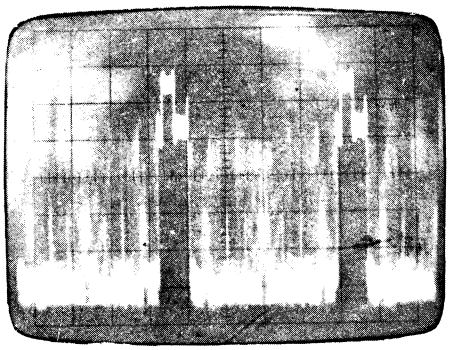


Figure 7

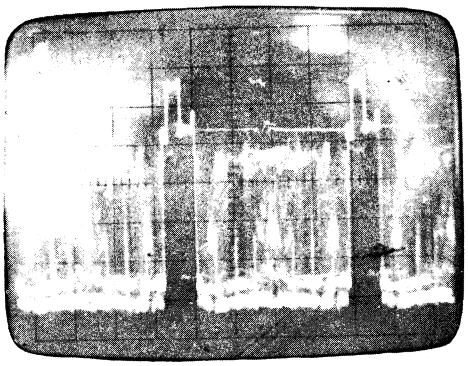


Figure 8

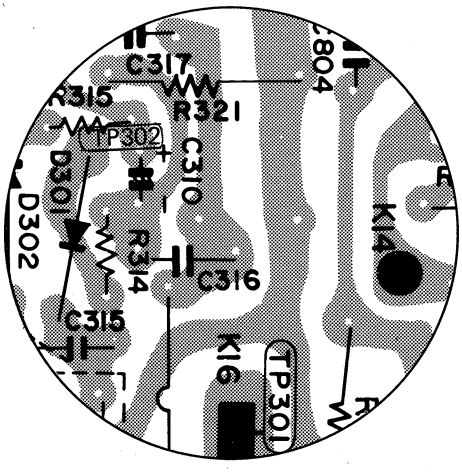


Figure 9

Sound IF Alignment

1. Connect the VTVM between a Test Point (TP302)and ground. (See Figures 5 & 9.)
2. Slightly detune the core of T303. If greatly detuned, T301 and T302 cannot be properly adjusted.
3. Reduce signal strength, if necessary, to facilitate tuning.
4. Adjust T301, T302 and T303 for maximum DC reading on the VTVM.
5. Remove the VTVM lead from Test Point (TP302) and reconnect to test point (TP301). (See Figure 9.)
6. Adjust T303 so that the pointer of the VTVM comes to zero center on the meter scale. If any hiss or distortion should now be detected in the sound output, repeat complete sound alignment procedure.

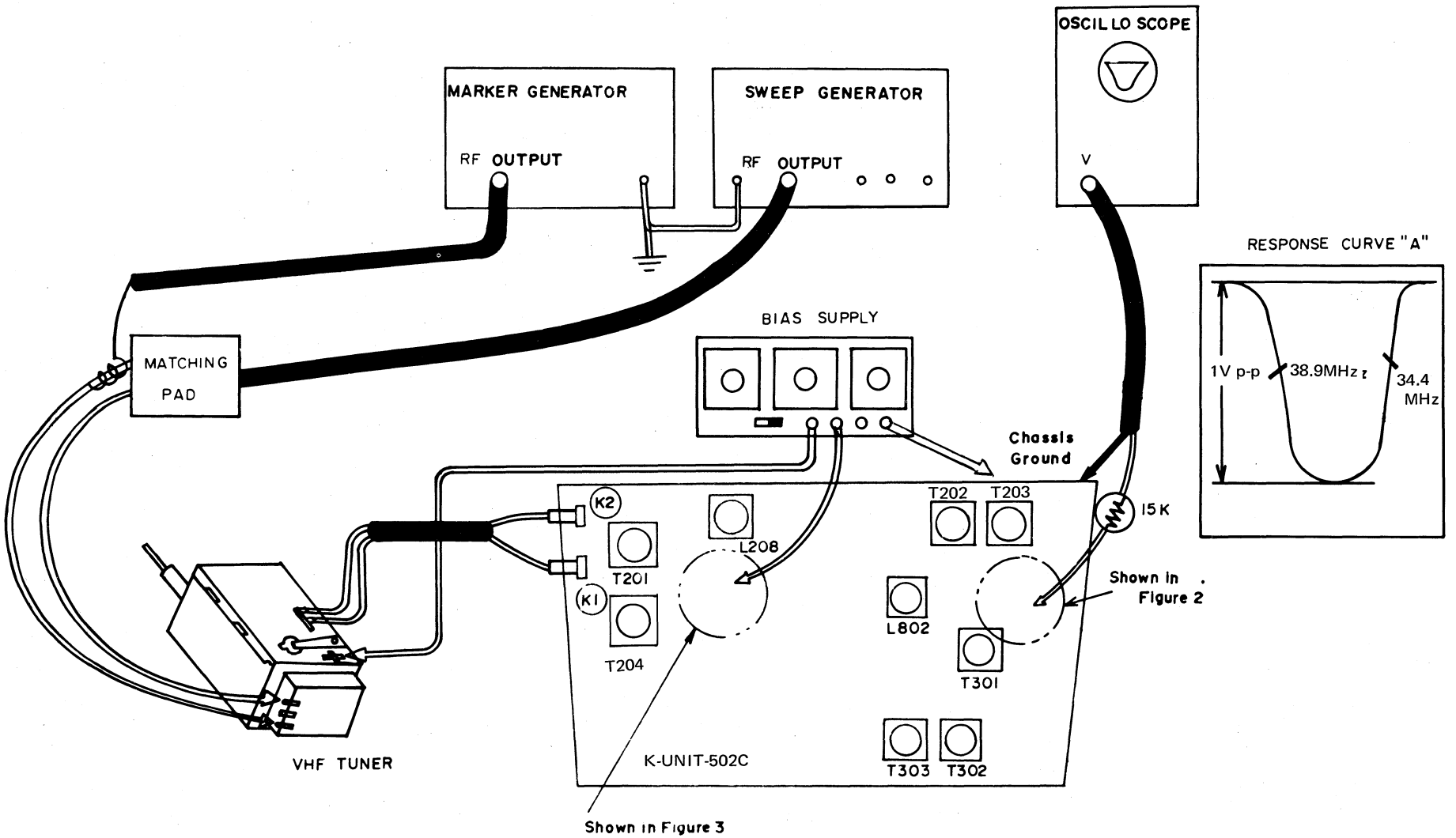
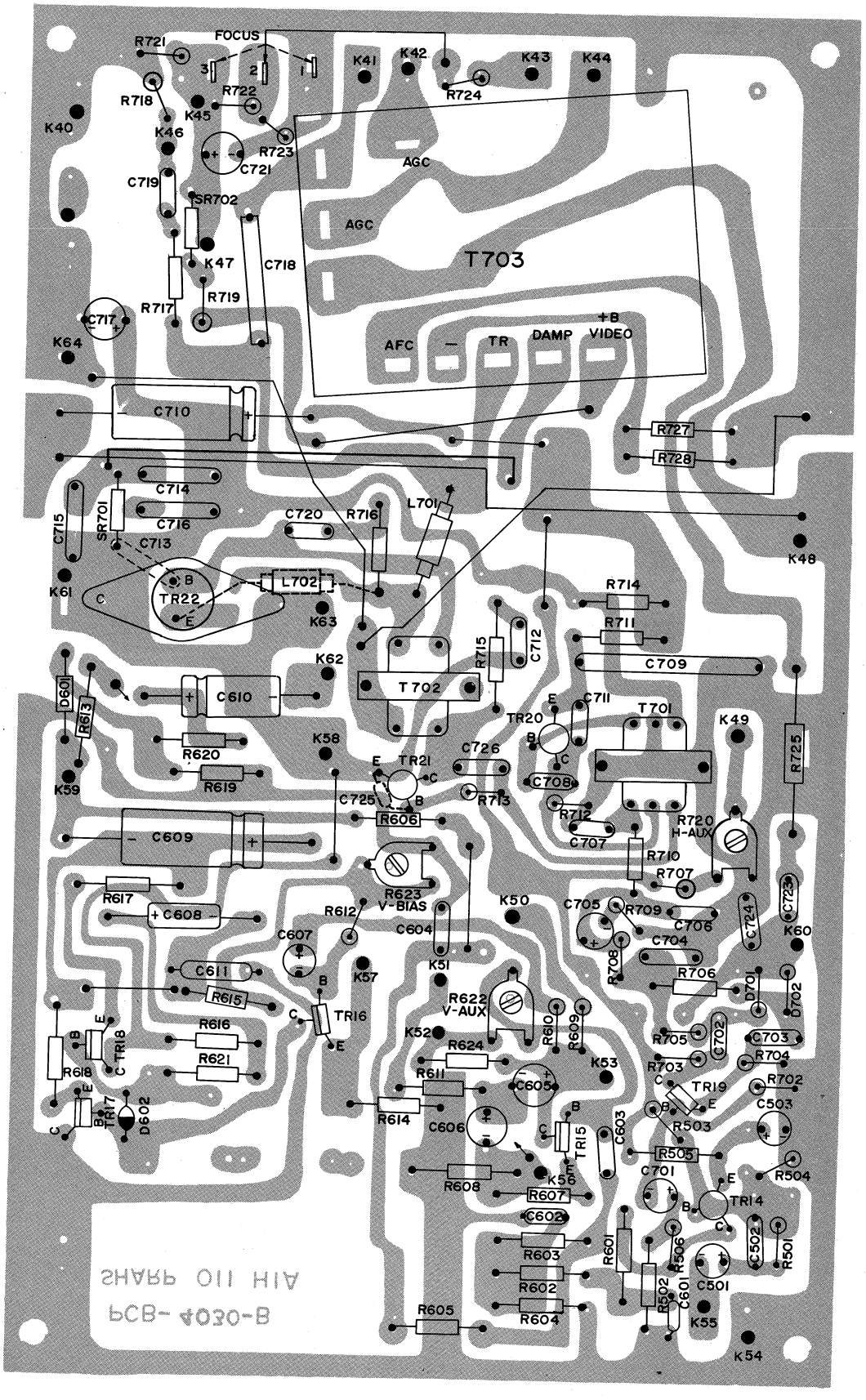

OSCILLOSCOPE
V
MARKER GENERATOR
RF OUTPUT
SWEEP GENERATOR
RF OUTPUT
RESPONSE CURVE "A"
1V p-p
38.9MHz
34.4 MHz
BIAS SUPPLY
MATCHING PAD
Chassis Ground
15K
K2
K1
T201
T204
L208
T202
T203
L802
T301
Shown in Figure 2
T303
T302
K-UNIT-502C
VHF TUNER
Shown in Figure 3

Figure 6



Component Side of P.C. Board (K-UNIT 502B)

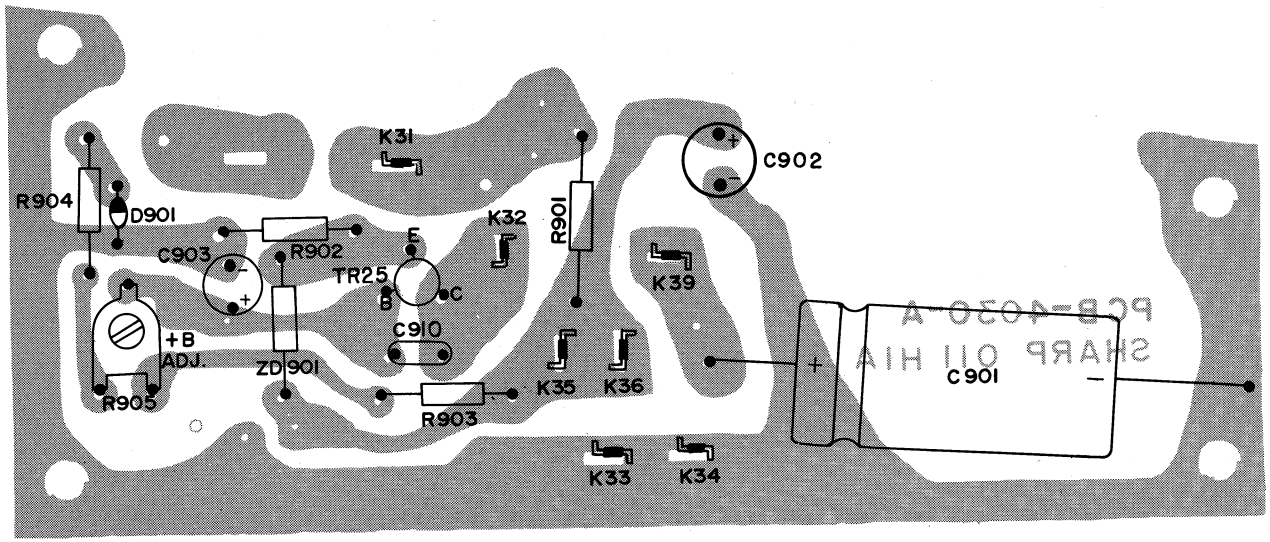


Figure 10 **Component Side of P.C. Board (K-UNIT 502A)**

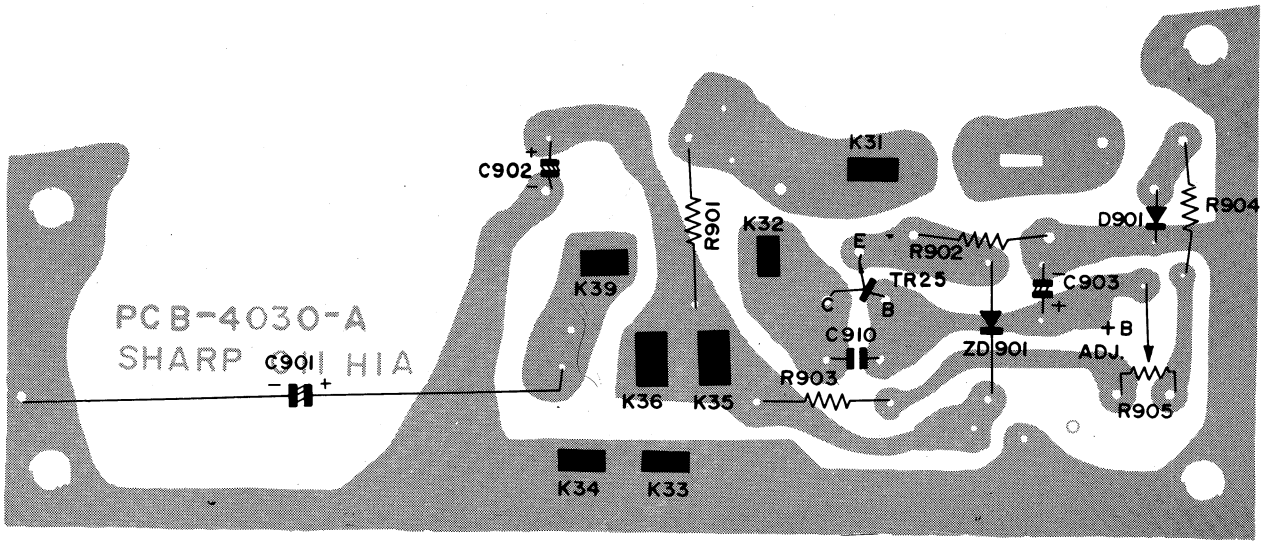
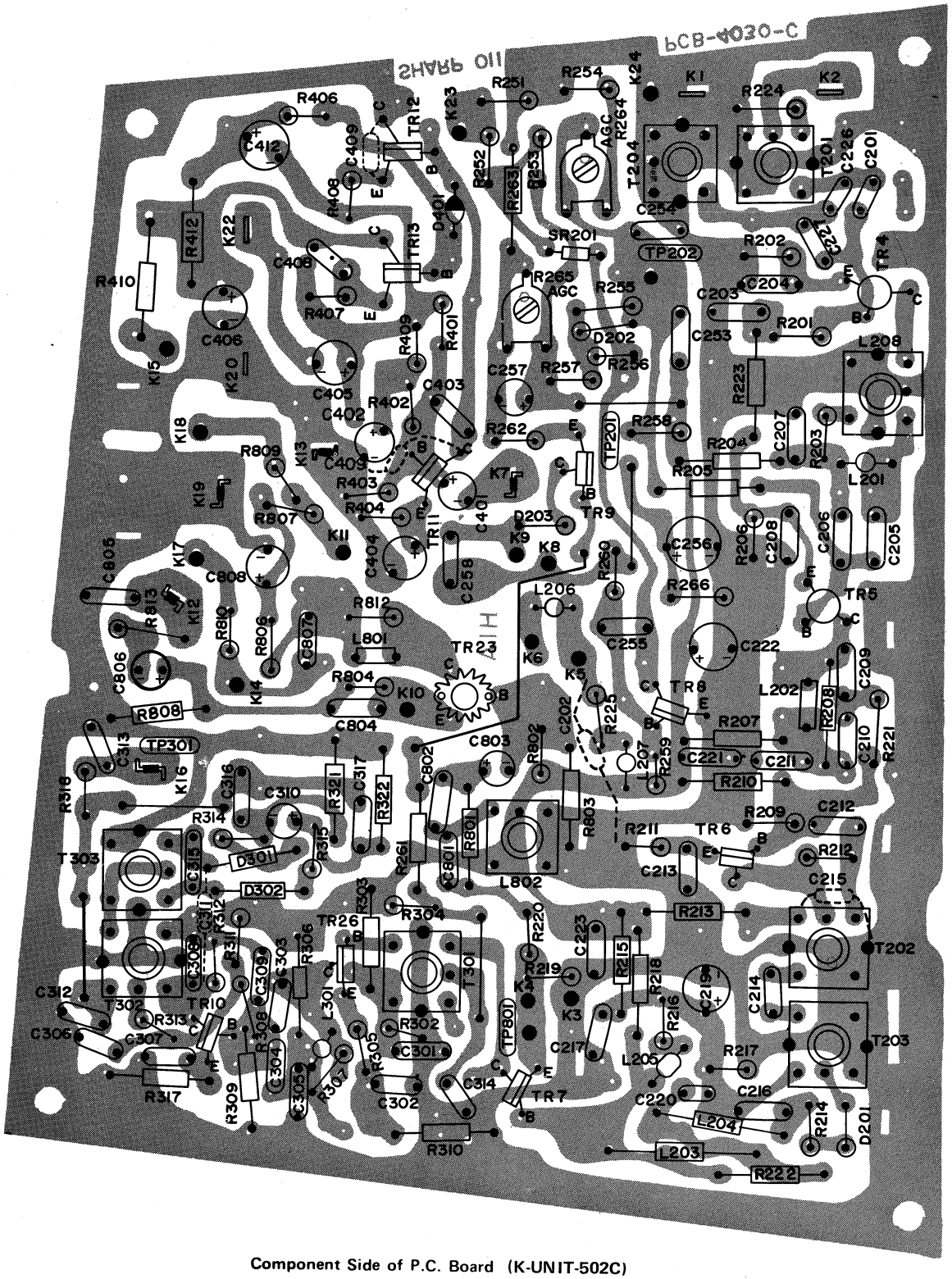
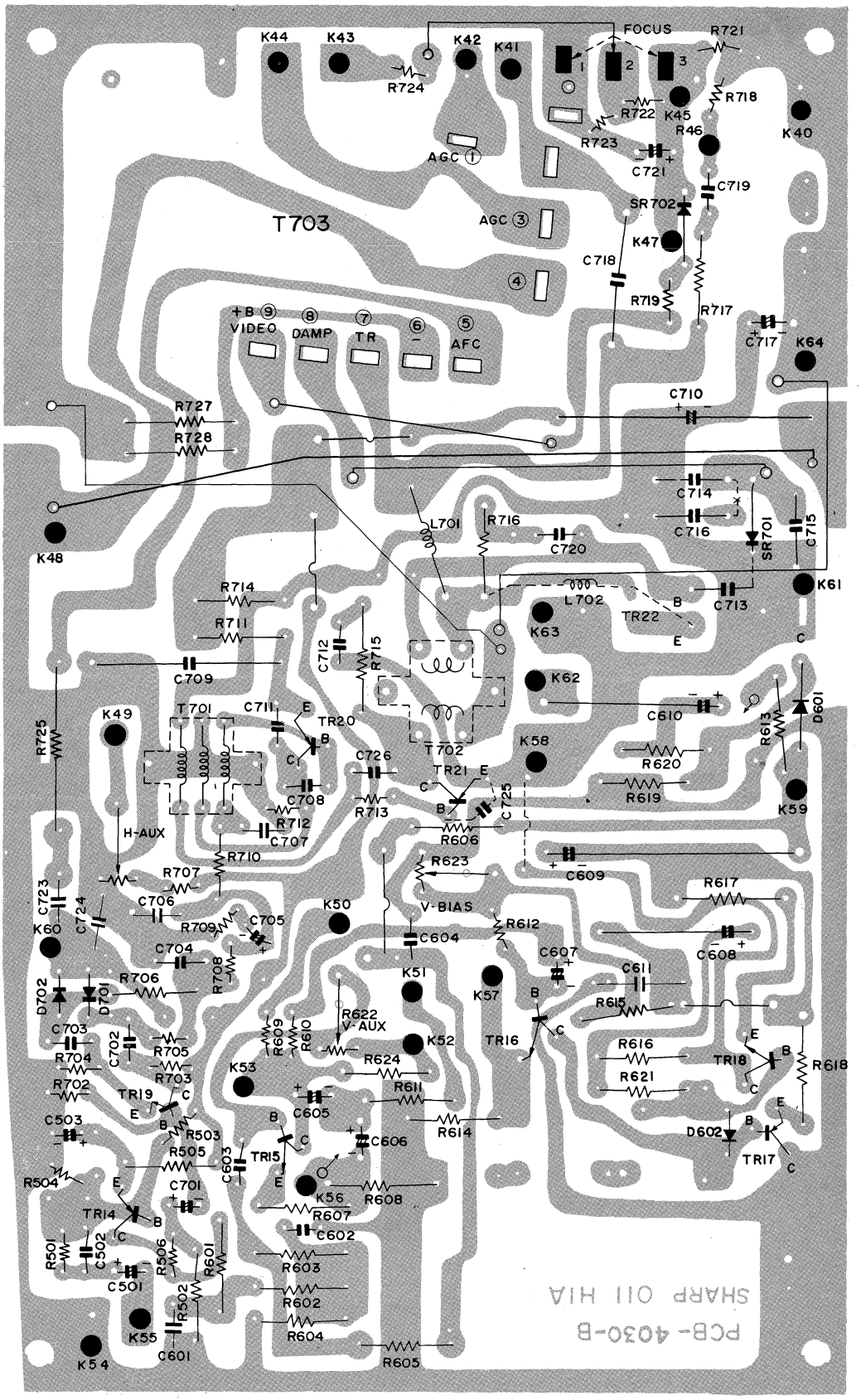


Figure 11 **Wiring Side of P.C. Board (K-UNIT 502A)**

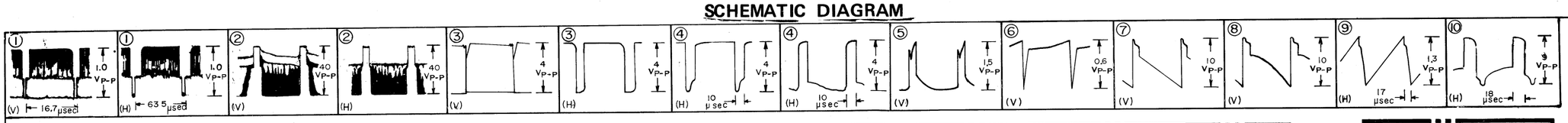


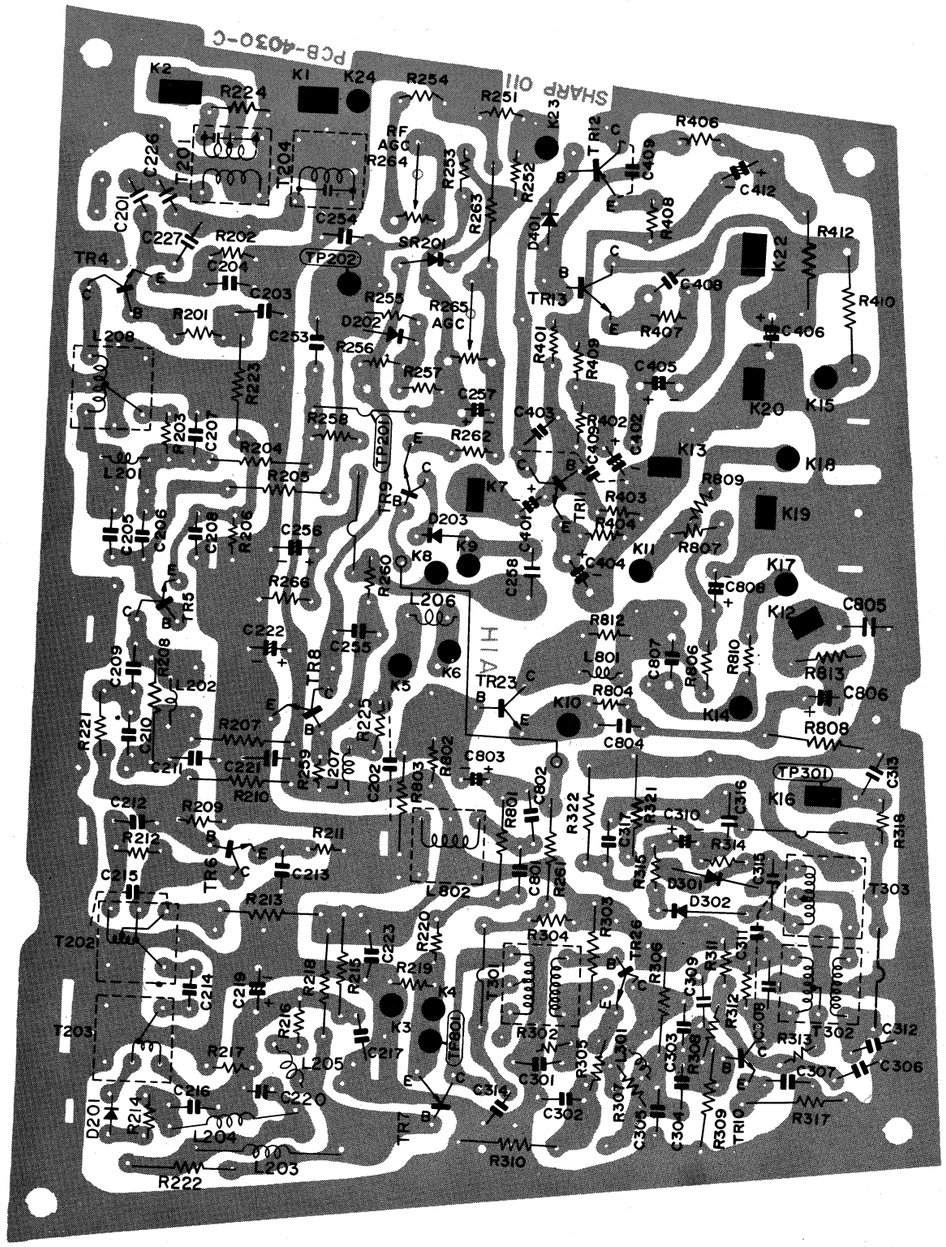
Component Side of P.C. Board (K-UNIT-502C)



Wiring Side of P.C. Board (K-UNIT-502B)

SCHEMATIC DIAGRAM


① 1.0 Vp-p (V) 16.7 μsec
① 1.0 Vp-p (H) 63.5 μsec
② 40 Vp-p (V)
② 40 Vp-p (H)
③ 4 Vp-p (V)
③ 4 Vp-p (H)
④ 4 Vp-p (H) 10 μsec
④ 4 Vp-p (H) 10 μsec
⑤ 1.5 Vp-p (V)
⑥ 0.6 Vp-p (V)
⑦ 10 Vp-p (V)
⑧ 10 Vp-p (V)
⑨ 1.3 Vp-p (H) 17 μsec
⑩ 9 Vp-p (H) 18 μsec



Wiring Side of P.C. Board (K-UNIT-502C)

PARTS LIST

REF. NO.	DESCRIPTION	PART NAME
CAPACITORS		
C201	47PF, 50V, 5%, Discap	D-5-478J
C202	.001MFD, 50V, Discap	D-5-106P
C203,C204, C207,C208, C211,C213, C215,C217, C221,C223, C254	.01MFD, 50V, Discap	D-5-105P
C205	56PF, 50V, 5%, Discap	D-5-568J
C206	68PF, 50V, 5%, Discap	D-5-688J
C209	82PF, 50V, 5%, Discap	D-5-828J
C210	120PF, 50V, 5%, Discap	D-5-127J
C212,C226	7PF, 50V, .5PF, Discap	D-5-709D
C214	1.5PF, 50V, .25PF, Discap	D-5-159C
C216,C220	10PF, 50V, .5PF, Discap	D-5-108D
C219	10MFD, 16V, Electrolytic	CU1.6-102Q
C222	100MFD, 16V, Electrolytic	CU1.6-101Q
C227	4PF, 50V, .5PF, Discap	D-5-409D
C251	33MFD, 25V, Electrolytic	CU2.5-332Q
C252,C253	.1MFD, 50V, 10%, Mylar	ML-5-104K
C255	470PF, 50V, 10%, Discap	D-5-477K
C256	47MFD, 16V, 20%, Electrolytic	CU1.6-472M
C257	100MFD, 6.3V, Electrolytic	CU-06-101Q
C258	100PF, 50V, 5%, Discap	D-5-107K
C301,C302, C305,C306	.01MFD, 50V, Discap	D-5-105P
C303	330PF, 50V, 5%, Discap	D-5-337J
C304	470PF, 50V, 5%, Discap	D-5-477J
C307	.0022MFD, 50V, 10%, Discap	D-5-226K
C308	120PF, 50V, 5%, Discap	D-5-127J
C309	2PF, 50V, .5PF, Discap	D-5-209D
C310	10MFD, 16V, Electrolytic	CU1.6-102Q
C311	22PF, 50V, 10%, Discap	D-5-228K
C312	.0047MFD, 50V, 10%, Discap	D-5-476K
C313	.001MFD, 50V, 10%, Mylar	ML-5-106K
C314	220PF, 50V, 10%, Discap	D-5-227K
C315	210PF, 50V, 5%, Discap	DRH-5-217J
C316,C317	.001MFD, 50V, 10%, Discap	D-5-106K
C401	10MFD, 16V, Electrolytic	CU1.6-102Q
C402	1MFD, 50V, Electrolytic	CU-5-103R
C403	.001MFD, 50V, Discap	D-5-106P
C404	100MFD, 6.3V, Electrolytic	CU-06-101Q
C405,C406	220MFD, 16V, Electrolytic	CU1.6-221Q
C407,C410	.01MFD, 50V, Discap	D-5-105P
C408,C409, C411	.01MFD, 50V, Discap	D-5-105P
C412	33MFD, 10V, Electrolytic	CU-1-332Q
C501	1MFD, 50V, Electrolytic	CU-5-103R
C502	.033MFD, 50V, 10%, Mylar	ML-5-335K
C503	3.3MFD, 50V, Electrolytic	CU-5-333R
C601,C602	.0047MFD, 50V, 10%, Mylar	ML-5-476K
C603	.068MFD, 50V, 10%, Mylar	ML-5-685K
C604	.01MFD, 50V, 10%, Mylar	ML-5-105K
C605,C606	10MFD, 25V, 20%, Electrolytic	CU2.5-102M
C607	33MFD, 10V, Electrolytic	CU-1-332Q
C608	47MFD, 6.3V, Electrolytic	CT-06-472Q
C609	470MFD, 16V, Electrolytic	CT1.6-471Q
C610	33MFD, 35V, Electrolytic	CT3.5-332Q
C611	.22MFD, 50V, 10%, Mylar	ML-5-224K
C701	4.7MFD, 25V, Electrolytic	CU2.5-473R
C702,C707	.01MFD, 50V, 10%, Mylar	ML-5-105K
C703,C712	.022MFD, 50V, 10%, Mylar	ML-5-225K
C704,C719, C720	.047MFD, 50V, 10%, Mylar	ML-5-475K
C705	3.3MFD, 25V, Electrolytic	CU2.5-333R
C706	.22MFD, 50V, 10%, Non-Polar	NPM-5-224K
C708	470PF, 50V, 10%, Discap	D-5-477K
C709	.3MFD, 50V, 5%, Non-Polar	NPM-5-304J
C710	470PF, 16V, Electrolytic	CT1.6-471Q
C711	.001MFD, 50V, 10%, Mylar	ML-5-106K
C713	.0022MFD, 500V, 10%, Mylar	ML-50-226K
C714	.0068MFD, 630V, 10%, Polypro Film	PFA63-686K
C715	.01MFD, 630V, 10%, Polypro Film	PFA63-105K
C716	.001MFD, 630V, 10%, Polypro Film	PFA63-106K
C717	100MFD, 16V, Electrolytic	CU1.6-101Q
C718	2.2MFD, 50V, 10%, Lackered Film	PML-5-223K
C721	1MFD, 250V, Electrolytic	CU-25-103R

REF. NO.	DESCRIPTION	PART NAME
CAPACITORS		
C723	.3MFD, 50V, 10%, Non-Polar	NPM-5-304K
C724	.1MFD, 50V, 10%, Mylar	ML-5-104K
C725,C726	100PF, 50V, 10%, Discap	D-5-107K
C801,C802	39PF, 50V, 10%, Discap	D-5-398K
C803	10MFD, 16V, Electrolytic	CU1.6-102Q
C804	.001MFD, 50V, 10%, Mylar	ML-5-106K
C805	470PF, 50V, 10%, Discap	D-5-477K
C806	100MFD, 6.3V, Electrolytic	CU-06-101Q
C807	.1MFD, 200MFD, 10%, Non-Polar	NPM20-104K
C808	1MFD, 250V, Electrolytic	CU-25-103R
C809	.01MFD, 50V, Discap	D-5-105P
C901	1000MFD, 35V, Electrolytic	CT3.5-100Q
C902	220MFD, 16V, Electrolytic	CU1.6-221Q
C903	10MFD, 16V, Electrolytic	CU1.6-102Q
C904,C905, C906,C907	.001MFD, 50V, Discap	D-5-106P
C908,C909, C922	220PF, AC400V, Discap	D-227K-V
C910	.001MFD, 50V, Discap	D-5-106P
C911,C912	.0033MFD, Discap	D-336M-S
C913	100MFD, 35V, Electrolytic	CU3.5-101Q
C914	4.7MFD, 50V, Electrolytic	CU-5-473R
C915,C916	47MFD, 50V, Electrolytic	CU-5-472Q
C918	.0056MFD, 500V, 10%, Discap	D-50-566K
RESISTORS		
R201	180 ohm	1/4PU180K
R202	330 ohm	1/4PU330K
R203	1.5K ohm, 1/4W, 5%, Carbon	1/4PU1.5KJ
R204,R207	220 ohm	1/4MF220K
R205	180 ohm	1/4MF180K
R206	470 ohm	1/4PU470K
R208	560 ohm	1/4MF560K
R209,R257	1K ohm	1/4PU1KK
R210	6.8K ohm	1/4MF6.8KK
R212,R255	18K ohm	1/4PU18KK
R213,R223	47 ohm	1/4MF47K
R214	390 ohm	1/4PU390K
R215	1.8K ohm	1/4MF1.8KK
R216,R258	4.7K ohm	1/4PU4.7KK
R217,R254	2.2K ohm	1/4PU2.2KK
R218	68K ohm	1/4MF68KK
R219,R252	680 ohm	1/4PU680K
R220	47 ohm	1/4PU47K
R221	15 ohm	1/4M-15K
R222	4.7K ohm	1/4MF4.7KK
R224	6.8K ohm	1/4PU6.8KK
R225	3.9 ohm, 1/2W, 10%, Carbon	1/2M-3.9K
R251,R260	3.3K ohm	1/4PU3.3KK
R253	12K ohm	1/4PU12KK
R256	270 ohm	1/4PU270K
R259	100K ohm	1/4PU100KK
R261	1K ohm	1/4MF1KK
R263	2.2K ohm	1/4MF2.2KK
R266	15K ohm	1/4PU15KK
R302	3.9K ohm	1/4PU3.9KK
R303,R317	1.5K ohm	1/4MF1.5KK
R304	270 ohm	1/4PU270K
R305	68 ohm	1/4PU68K
R306	270 ohm	1/4MF270K
R307,R318	1K ohm	1/4PU1KK
R308	1.5K ohm	1/4PU1.5KK
R309	3.9K ohm	1/4MF3.9KK
R310	15K ohm, 1/4W, 5%, Carbon	1/4MF1.5KJ
R311,R313	47 ohm	1/4PU47K
R312	10K ohm	1/4PU10KK
R314,R315	1K ohm, 1/4W, 5%, Carbon	1/4PU1KJ
R321,R322	3.9K ohm, 1/4W, 5%, Carbon	1/4MF3.9KJ
R401	150K ohm	1/4PU150KK
R402	18K ohm	1/4PU18KK
R403	8.2K ohm	1/4PU8.2KK
R404	120 ohm	1/4PU120K
R406	820 ohm	1/4PU820K
R407,R408	2.2 ohm, 1/2W, 10%, Carbon	1/2M-2.2K
R409	22K ohm	1/4PU22KK
R410	15K ohm, 1/2W, 10%, Carbon	1/2MF15K
R411	150 ohm, 1/2W, 10%, Carbon	1/2M-150K

PARTS LIST

REF. NO.	DESCRIPTION	PART NAME
RESISTORS		
R412	390 ohm	1/4MF390K
R501	560 ohm	1/4PU560K
R502,R505	10K ohm	1/4MF10KK
R503	27K ohm	1/4PU27KK
R504	1 Megohm, 1/2W, 10%, Carbon	1/2M-1MK
R506	1.5K ohm	1/4PU1.5KK
R601	18K ohm	1/4MF18KK
R602,R615	15K ohm	1/4MF15KK
R603	3.9K ohm	1/4MF3.9KK
R604	39K ohm	1/4MF39KK
R605,R606	4.7K ohm	1/4MF4.7KK
R607,R614	10 ohm	1/4MF10K
R608	3.3 ohm, 1/2W, 5%, Carbon	1/2MF3.3J
R609	15K ohm	1/4PU15KK
R610	470 ohm	1/4PU470K
R611,R621	560 ohm	1/4MF560K
R612	68K ohm, 1/4W, 5%, Carbon	1/4PU68KJ
R613,R616, R620	330 ohm	1/4MF330K
R617,R618	1.2 ohm, 1/2W, 10%, Carbon	1/2MF1.2K
R619	18K ohm, 1/4W, 5%, Carbon	1/4MF18KJ
R624	560K ohm	1/4MF560KK
R702	5.6K ohm	1/4PU5.6KK
R703	120 ohm	1/4PU120K
R704	100 ohm	1/4PU100K
R705	1K ohm	1/4PU1KK
R706	1K ohm	1/4MF1KK
R707	2.2K ohm	1/4PU2.2KK
R708,R712	820 ohm	1/4PU820K
R709	390 ohm	1/4PU390K
R710	180 ohm	1/4M-180K
R711	560 ohm	1/4MF560K
R713	33 ohm	1/4PU33K
R714	82 ohm	1/4MF82K
R715	270 ohm, 1/2W, 10%, Carbon	1/2MF270K
R716	18 ohm	1/4MF18K
R717	10K ohm	1/4MF10KK
R718	390K ohm	1/4PU390KK
R719	150 ohm, 1/2W, 10%, Carbon	1/2M-150K
R721	150K ohm,	1/4PU150KK
R722,R724	220K ohm	1/4PU220KK
R723	680K ohm	1/4PU680KK
R725	680 ohm, 2W, 10%, Oxide Film	2PO-680K
R726	100K ohm	1/4M-100KK
R727,R728	1.2 ohm, 1/2W, 10%, Carbon	1/2MF1.2K
R801	15 ohm	1/4MF15K
R802	3.9K ohm	1/4PU3.9KK
R803	2.2K ohm	1/4MF2.2KK
R804	180 ohm	1/4PU180K
R806	12K ohm, 1/2W, 5%, Carbon	1/2M-12KJ
R807	1K ohm, 1/2W, 10%, Carbon	1/2M-1KK
R808	1.2K ohm	1/4MF1.2KK
R809	180K ohm	1/4PU180KK
R810	560K ohm	1/4PU560KK
R811	1.2K ohm	1/4M-1.2KK
R812	12K ohm	1/4PU12KK
R813	10 ohm	1/4PU10K
R901	100 ohm, 1W, 10%, Oxide Film	1PO-100K
R902	270 ohm	1/4MF270K
R903	470 ohm	1/4MF470K
R904	390 ohm	1/4MF390K
R905	27 ohm, 3W, 10%, Resin	3LL-27K
R906	470K ohm, 1/2W, 10%, Carbon	1/2M-470KK

Unless otherwise specified all resistors are 1/4W, 10%, Carbon type.

CONTROLS

R264	5K ohm, Pot., AGC	9V-308
R265	1K ohm, Pot., AGC	6V-210
R413	10K ohm, Pot., Off-On Volume	6V-266
R622	100K ohm, Pot., V-Aux.	6V-212
R623	20K ohm, Pot., V-Bias	6V-214
R701A,B,C, D	500 ohm/100K ohm/2K ohm/ 50K ohm, Pot., H-Hold/V-Hold/ V-Lin/V-Size	6V-276
R720	500 ohm, Pot., H-Aux.	9V-304

REF. NO.	DESCRIPTION	PART NAME
CONTROLS		
R821	1K ohm, Pot., Contrast	6V-216Z
R813	250K ohm, Pot., Brightness	9V-198Z
COILS AND TRANSFORMERS		
L201	Coil, Peaking	9L-219
L202	Coil, Peaking	TL-77
L203,L204	Coil, Peaking	TL-42
L205	Coil, Peaking	CL-221K
L206,L207	Coil, Filter	TL-626
L208	Coil, 40.4MHz Adj. Trap	9IF-530
L301	Coil, Peaking	9L-222
L701,L702	Coil, Snivet	TL-603
L801	Coil, Peaking	CL-181K
L802	Coil, 5.5MHz Sound Trap	9IF-477
L901	Coil, Balum	TL-721
T201	Transformer, 1st Pix IF	9IF-529
T202	Transformer, 2nd Pix IF	9IF-606
T203	Transformer, 3rd Pix IF	9IF-676
T204	Transformer, 33.4MHz Sound Trap	9IF-537
T301	Transformer, Sound IF	9IF-678
T302	Transformer, Sound IF	9IF-534
T303	Transformer, Sound IF	9IF-535
T701	Transformer, Horizontal Oscillation	9T-180
T702	Transformer, Horizontal Drive	9T-278
T703	Transformer, Horizontal Flyback	X8FT-732
T901	Transformer, Power	5T-298
MISCELLANEOUS		
	Antenna (UHF), Loop	LOOP-ANT16
	Antenna (VHF), Telescoping Monopole	XROD-A-138
	Cabinet Back, Light Gray	1CAB-3504B-02
	Cabinet Back, Orange	1CAB-3504B-01
	Cabinet Front, Light Gray	1CAB-3448A-04
	Cabinet Front, Orange	1CAB-3448A-03
	Case, Battery, Light Gray	B-CASE-28-02
	Case, Battery, Orange	B-CASE-28-01
	Cord, AC Adaptor	ACC-296
	Cord, DC Adaptor	ACC-348
	Earphone	MR-2G1
	Fuse, 02A	FS-0.2A-E
	Fuse, 0.8A	FS-0.8A-E
	Handle, Grip	HANDLE-3448
	Jack, DC	J-314
	Jack, Earphone	J-116
	Knob, VHF Channel Selector	7K-3126-02
	Knob, VHF Fine Tuning	7K-914-01
	Knob, UHF Tuning	7K-3128-02
	Knob, UHF Fine Tuning	7K-916-01
	Knob, Brightness, Contrast	7K-521Z-01
	Knob, Off-On Volume	7K-521Z-02
	Panel, Smoked Screen	FRONTC3504
	Printed Wiring Board	K-UNIT502A
	Printed Wiring Board	K-UNIT502B
	Printed Wiring Board	K-UNIT502C
	Socket, CRT	SO-684
	Speaker, 2.56" Round	6.5P-0832
SW901	Switch, Rechargeable/Dry Battery	X4S-4
SW902,SW903	Switch, TV/Charge, Antenna Ext./Int.	X4S-4
	Tuner, UHF	UT9-2C7
	Tuner, VHF	XET1-1CH
	Yoke, Deflection	2DC-148

ADAPTER

	AC Adapter (Light Gray)	
	AC Adapter (Orange)	